The author is constantly and terribly mixed up in his statements and notations, though of course not in his ideas, about number and magnitude. Unless the reader can supply a great deal he cannot properly interpret the statements on pages 9, 43, 66, 343, and I fear that there are exercises (for the freshman) on this last page which I could not myself answer with any assurance of agreeing with the author.

Slichter's Elementary Mathematical Analysis should be widely tried out, if only for the rest that it will give the teacher from the familiar beaten paths; there is a charming freshness about the work and, whether we like it or not, it is bound to be ranked as a distinct contribution to the theory and practice of freshman instruction in mathematics.

E. B. Wilson.

Massachusetts Institute of Technology.

PROBLEMS AND SOLUTIONS.

Edited by B. F. Finkel and R. P. Baker.

PROBLEMS FOR SOLUTION.

ALGEBRA.

When this issue was made up, no solutions had been received for numbers 417–426.

426. Proposed by HERBERT N. CARLETON, West Newbury, Mass.

Find all the solutions of the equation $x\sqrt[x]{x} = x^x$.

427. Proposed by CLIFFORD N. MILLS, Brookings, S. Dak.

If $r \sin(\theta + \alpha) = m$ and $r \cos(\theta + \beta) = n$, show that

$$r = \frac{\sqrt{m^2 + n^2 - 2mn \sin(\alpha - \beta)}}{\cos(\alpha - \beta)},$$

GEOMETRY.

When this issue was made up, no solutions had been received for numbers 447–8, 450–454.

455. Proposed by R. P. BAKER, University of Iowa.

Find the minimum triangle of assigned angles inscribed in a given triangle.

456. Proposed by J. W. CLAWSON, Ursinus College.

The interior and exterior bisectors of the angles A, B, C of a triangle meet the opposite sides in U, U'; V, V'; W, W' respectively. Circles are drawn on UU', VV', WW' as diameters (Circles of Apollonius.) Prove that (1) These three circles have a common chord. (2) The centre of the circumcircle lies on this common chord.

CALCULUS.

When this issue was made up, no solutions had been received for numbers 358, 361–2, 364–372, 374–5, and 377.

376. Proposed by S. A. COREY, Hiteman, Iowa.

Prove that

$$\frac{1}{z} - \frac{1}{z}(1 - 2xz + z^2)^{\frac{1}{2}} = x + \frac{z}{2}\left(\frac{x^2 - 1}{1 - xz}\right) + \sum_{n=2}^{\infty} \frac{1, 3, 5 \cdots 2n - 3}{2, 4, 6 \cdots 2n}(x^2 - 1)^n \left(\frac{z}{1 - xz}\right)^{2n-1}$$

377. Proposed by W. D. CAIRNS, Oberlin College.

It is required to find a curve of the form $y = x(x - a)(x - b)$ such that the abscissas of the maximum and minimum values, as well as a and b, shall be positive integers.

MECHANICS.

When this issue was made up, no solutions had been received for numbers 289, 292–3, 295–299, 301, and 303.

302. Proposed by CLIFFORD N. MILLS, Brookings, S. Dak.

A ball is projected from a given point at a given inclination β towards a vertical wall; determine the velocity so that after striking the wall the ball may return to the point of projection.

NUMBER THEORY.

When this issue was made up, no solutions bad been received for numbers 215–16, 218, 220, and 223–226.

226. Proposed by ELBERT H. CLARKE, Purdue University.

If $0!$ is taken equal to 1, and if k is any positive integer greater than or equal to 2, show that

$$\sum_{n=0}^{\infty} \frac{n!}{(k+n)!} = \frac{1}{(k-1)} \cdot \frac{1}{(k-1)!}.$$

227. Proposed by R. P. BAKER, University of Iowa.

Show that every rational number can be expressed as a finite sum $\sum_{n=m}^{n=m+k} \frac{a_n}{n}$, where a_n is either 0 or 1 and m is any positive integer.

SOLUTIONS OF PROBLEMS.

ALGEBRA.

409. Proposed by C. E. GITHENS, Wheeling, W. Va.

Find integral values for the edges of a rectangular parallelopiped so that its diagonal shall be rational.

II. SOLUTION BY ARTEMAS MARTIN, Washington, D. C.

On pp. 269–273 of the October, 1914, MONTHLY, W. C. Eells has solved a different problem from the one proposed. In making $x^2 + y^2 = \square$, he adds another condition not required.

Let x, y, z be the edges and d the diagonal of the parallelepiped; then we have to satisfy the equation

$$x^2 + y^2 + z^2 = d^2.$$

It is not necessary that $x^2 + y^2$ be a square. Let us assume $x = a$, $y = b$, $z + c = d$, and we have

$$a^2 + b^2 + z^2 = (z + c)^2 = z^2 + 2cz + c^2,$$

which immediately gives

$$z = \frac{a^2 + b^2 - c^2}{2c} \qquad \text{and} \qquad d = \frac{a^2 + b^2 + c^2}{2c}.$$